

Fourth set of exercises:
 χ^2 tests.

1. We casted a 6 sided die and got the following results:

1	2	3	4	5	6
32	28	20	10	50	30

Is the die fair? ($\alpha = 0.05$).

2. We performed an opinion poll about which Soda brands is preferred among the students. We got the following results:

Cola Loca	Pipse Cola	Jalisco Rico Cola	Itchy Cola
130	140	230	50

We wonder if the proportions of preference is 2/2/4/1. Is this true? ($\alpha = 0.05$).

3. We refined the previous poll, taking into account the ages. We got the following results:

	Cola Loca	Pipse Cola	Jalisco Rico Cola	Itchy Cola
< 35	80	90	185	12
≥ 35	50	50	45	38

Is it true that the preference is independent of the age? ($\alpha = 0.05$).

4. The following table represents the number of bike accidents in Uppsala in 2013. The data is sorted by age group and gender:

	Male	Female
14 – 18	3250	4321
19 – 30	2241	1441
31 – 65	3245	3753
> 65	532	212

Are the gender and age associated (independent)? ($\alpha = 0.05$).

5. Students from a high school where asked about their ice-cream preferences. From this poll we got the following data:

	Chocolate	Vanilla	Berries
12 – 14	234	512	123
14 – 16	112	243	78
16 – 18	80	212	324

Is the preference of the students homogeneous with respect to their age? ($\alpha = 0.05$).